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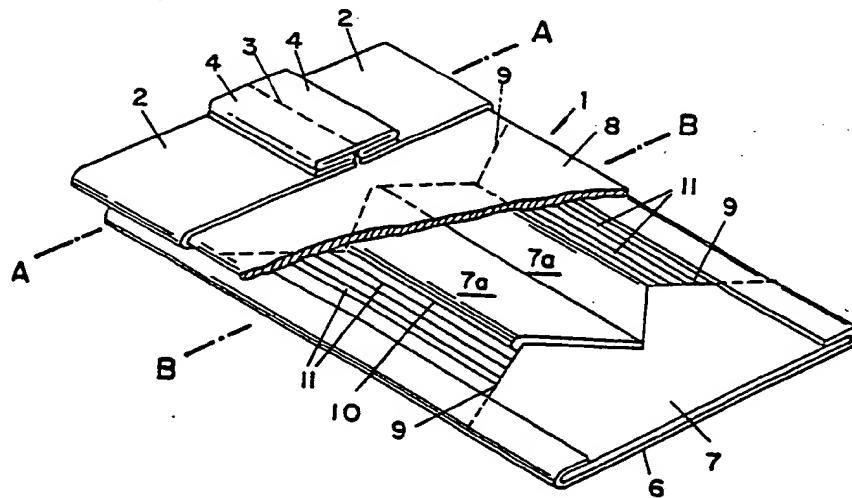
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>3</sup> :  A61F 13/16		A1	(11) International Publication Number: WO 84/ 04242  (43) International Publication Date: 8 November 1984 (08.11.84)
(21) International Application Number: PCT/US84/00586  (22) International Filing Date: 17 April 1984 (17.04.84)		(81) Designated States: AT (European patent), AU, BE (European patent), BR, CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), LU (European patent), NL (European patent), NO, SE (European patent), US.	
(31) Priority Application Number: 59823/83  (32) Priority Date: 21 April 1983 (21.04.83)		Published <i>With international search report.</i>	
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## (54) Title: DISPOSABLE PAPER DIAPER



## (57) Abstract

A paper disposable diaper (1) which is furnished with belt strips at the edges of at least one end of the main body which belt strips (2) are folded over on the upper surface of the diaper (2) and their ends joined together by a separable part (3).

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### DISPOSABLE PAPER DIAPER

#### Background of the Invention

5 The present invention concerns an improved disposable diaper, also identified as a "paper" diaper.

In the past, this type of disposable "paper" diaper was made by layering a water-absorbent layer such as paper or 10 cotton over synthetic resin film that is impermeable to water, such as a polyethylene, then covering this water-absorbent layer with a nonwoven fabric. However, when such paper diapers are worn by infants or the elderly, the paper diaper must be fastened around the hips.

15 As a means of fastening such a diaper, a suitable string can be placed around the hips after putting on the paper diaper. However, the string-shaped piece causes a feeling of pressure when it is tied tightly and there is a danger 20 of the paper diaper falling off if it is tied loosely. Moreover, not only is it necessary to furnish the string, etc. beforehand, but fastening the paper diaper with the string also has the drawback of consuming time and labor.

25 For this reason, belt strips came to be provided in a single piece with paper diapers. However, in this conventional type of paper diaper, the belt strips were furnished in an unfolded state in relation to the paper diaper, i.e., the base ends of the pair of belt strips on 30 the right and left were connected to the two edges of the paper diaper so that the belt strips laid along the front edge and extended past the outer sides of the paper diaper. Therefore, the belt strips could catch on things



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during handling or wear, or they could be damaged when pulled on forcibly. It was also necessary to fold the right and left belt strips on the upper face of each paper diaper when piling up a number of paper diapers.

5

Moreover, paper diapers are manufactured by successively overlapping the water-absorbent layer and long band-like nonwoven fabric over the long water-impermeable synthetic resin film that is being run continuously. However, to 10 manufacture the paper diapers with the belt strips discussed above, in which the belt strips project from the outside of both sides of the paper diaper, the belt strips must be furnished and arranged on longitudinal sides of the band-like nonwoven fabric. This makes the 15 manufacturing method extremely complicated.

#### Summary of the Invention

20 The present invention resolves these problems by proposing a paper diaper characterized by the fact that it is constructed such that the tips of the right and left belt strips are joined via a separable part, such as a perforation, or adhesive tape on the upper face of the main body of the paper diaper, so that the two sides can be separated 25 from this separable part at the time of use and opened out.

#### Brief Description of the Drawings

30 Figure 1 is a perspective view of one embodiment of the present invention with portions of the view broken away for clarity;

35 Figure 2 is a cross-sectional view along line A-A of Figure 1;



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Figure 3 is a cross-sectional view along line B-B of Figure 1;

5 Figure 4 is a plan view of one embodiment of the present invention;

Figure 5 is a cross-sectional view of another embodiment of the present invention; and

10 Figure 6 is a perspective view of a product of the invention when being worn by the user.

Detailed Description of the Invention

15 Practical examples of the present invention are explained through the figures. 1 is the main body of the long, rectangular paper diaper. The base ends of wide, rectangular right and left belt strips 2 2 that are made of a synthetic resin film such as polyethylene and nonwoven 20 fabric or some other suitable material are glued by hot melt or other suitable adhesion to the edges of both longitudinal sides of the main body of the diaper. Furthermore, these belt strips 2 2 are folded over at one 25 end of the upper face of the paper diaper main body 1 and their tips that lie opposite each other are joined together. Perforation 3 is provided longitudinally at the connected part, so that the right and left belt strips 2 2 can be separated and opened out by tearing at this perforation 3.

30 The tips of right and left belt strips 2 2 can be joined directly via perforation 3. In the figure, however, both sides of fixing strip 4, which is furnished with perforation 3 provided in the center along the entire length 35 between the upper surfaces of the tips of these belt strips 2 2 and is made of synthetic resin film, are folded



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over 1-2 times and glued by hot melt or other suitable adhesion so that the lower surfaces of both ends are joined to the upper surfaces of the tips of belt strips 2 2. With this construction, fixing strips 4 can be 5 separated from perforation 3 while pulling their folded-over part upward. This facilitates separation.

5 5 are adhesive (hot melt) painted on the lower surfaces of both adjoining parts of fixing strips 4 so that perforation 3 is in the center. As shown in Figure 6, the 10 paper diaper is fastened for wear by sticking this adhesive to the outer surface of the other end of paper diaper main body 1.

15 This adhesive 5 5 can also be painted on the lower surface of the tips of right and left belt strips 2 2.

In the above practical example, right and left belt strips 2 2 were only provided at one end on both sides of paper 20 diaper main body 1. However, they can also be provided on both sides of both ends. In this instance, the right and left belt strips on one side are spread with adhesive and glued to the surface of the right and left belt strips on the other end during wear.

25 Furthermore, right and left belt strips 2 2 were provided with perforation 3 but, as illustrated in Figure 5, the separable tips of the right and left belt strips 2 2 can also be joined so that they can still be separated by 30 adhesive tape strip 3a. In this case, as in the above practical example, the tips of right and left belt strips 2 2 can be connected directly, or the tips of fixing strips 4 4 that are each provided for the right and left belt strips 2 2 can be connected by adhesive tape strip 35 3a. It is only necessary to form separable part 3 by a perforation, adhesive tape strip, etc.



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Various constructions can be used for the paper diaper main body 1. The one shown in the figure has a water-absorbent layer 7 made of a paper or cotton layer or a pulp mat placed on top of long, rectangular water-  
5 impermeable synthetic resin film 6 such as polyethylene, polyester, polypropylene, etc. The upper surfaces of both sides of this water-absorbent layer 7 are folded over both sides of the above-mentioned film 6. The lower surfaces of both sides of the long, rectangular nonwoven fabric 8 are glued to this folded-over upper surface with a heat or pressure-sensitive adhesive or some other suitable adhesive. Moreover, two inclined cuts, each oriented toward the center of water-absorbent layer 7, are provided on both sides of water-absorbent layer 7. The longitudinal line that joins the inner edges between these inclined cuts 9 is called fold 10. Trapezoidal parts 7a 7a enclosed by this fold 10 and inclined cuts 9 are folded over on the upper surface of the water-absorbent layer of this part improves water absorption and retention. When 20 several elastic strips 11 are provided longitudinally between the edges of inclined cuts 9, the centers of both edges of paper diaper main body 1 fit sufficiently snugly to the inner thigh and prevent leakage.

25 Thus, the present invention is a paper diaper characterized by the fact that, in a paper diaper furnished with belt strips 2, at the edges of at least one end of the two ends of paper diaper main body 1, these belt strips 2 are folded over on the upper surface of paper diaper main body 1 and their tips that lie opposite one another are joined together via separable part 3, which is a perforation or adhesive tape strip, etc. Since these belt strips 2 do not project outside the paper diaper main body 1, even though belt strips 2 are provided at the 30 edges of both sides of paper diaper main body 1, damage by cutting belt strips 2, etc. during handling can be



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prevented. This also makes it easier and smoother to pile up several paper diapers. During use, the diaper can be put on easily by separating right and left belt strips 2 2 from separable part 3 after arranging the main body of the 5 paper diaper 1 in a U-shape passing under the thighs. When putting the diaper on, belt strips 2 2 do not get in the way and are not accidentally damaged since the right and left belt strips 2 2 are joined to the upper surface of paper diaper main body 1 via separable part 3.

10

Moreover, since belt strips 2 2 are provided joined on the upper surface of paper diaper main body 1, the paper diaper can be manufactured according to the conventional manufacturing process merely by situating belt strips 2 15 that are joined in the centers via separable part 3 along and gluing them to the upper surface of the nonwoven fabric that forms paper diaper main body 1.



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Claim

1. Paper diaper characterized by the fact that, in a paper diaper furnished with belt strips (2) (2) at the edges of at least one of the two ends of the main body (1) of the paper diaper, these belt strips (2) (2) are folded over on the upper surface of the paper diaper main body (1) and their opposite ends are joined together via a separable part (3) such as a perforation.



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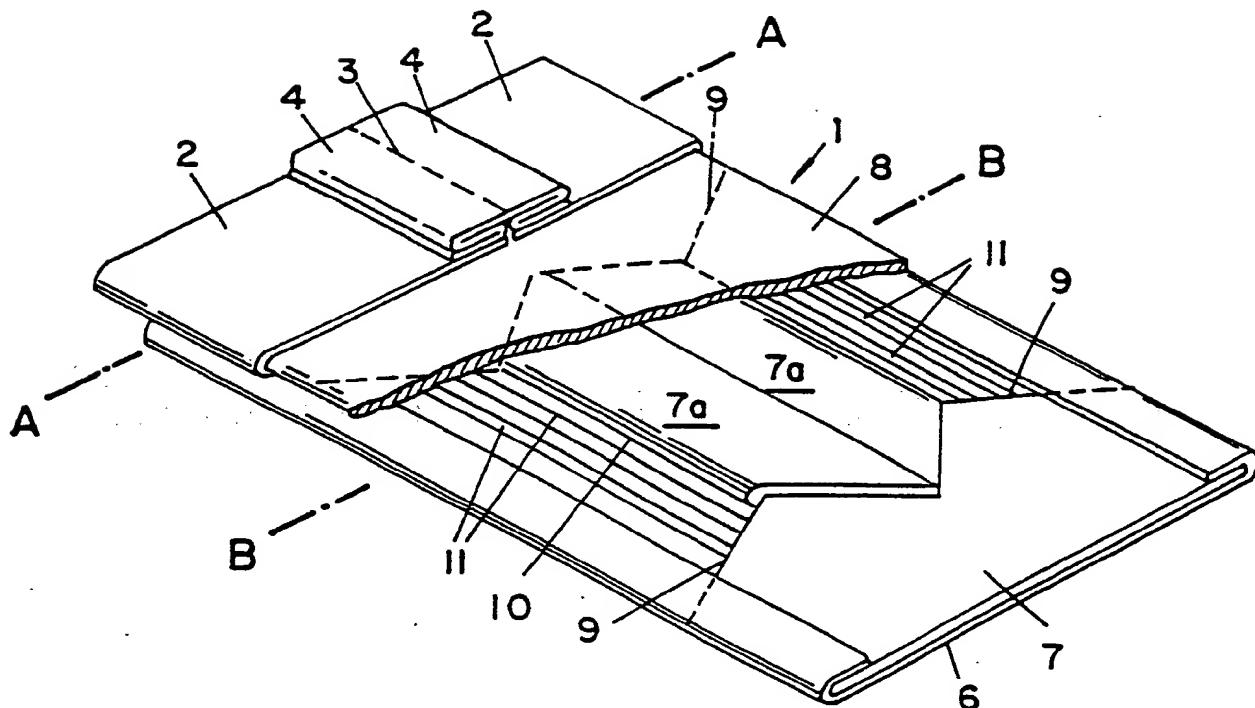


FIG. 1

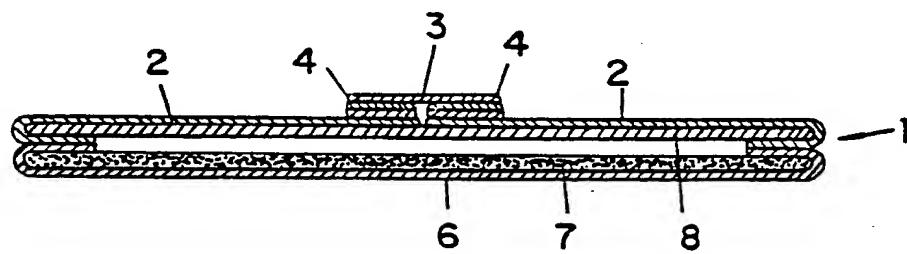


FIG. 2

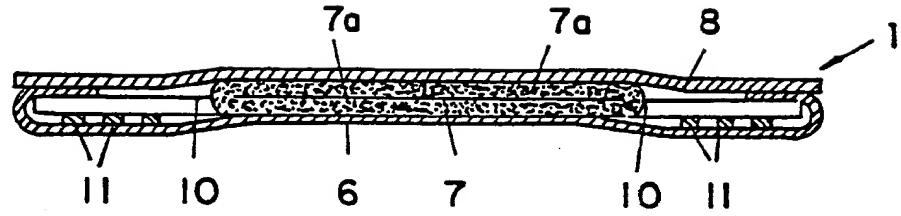


FIG. 3

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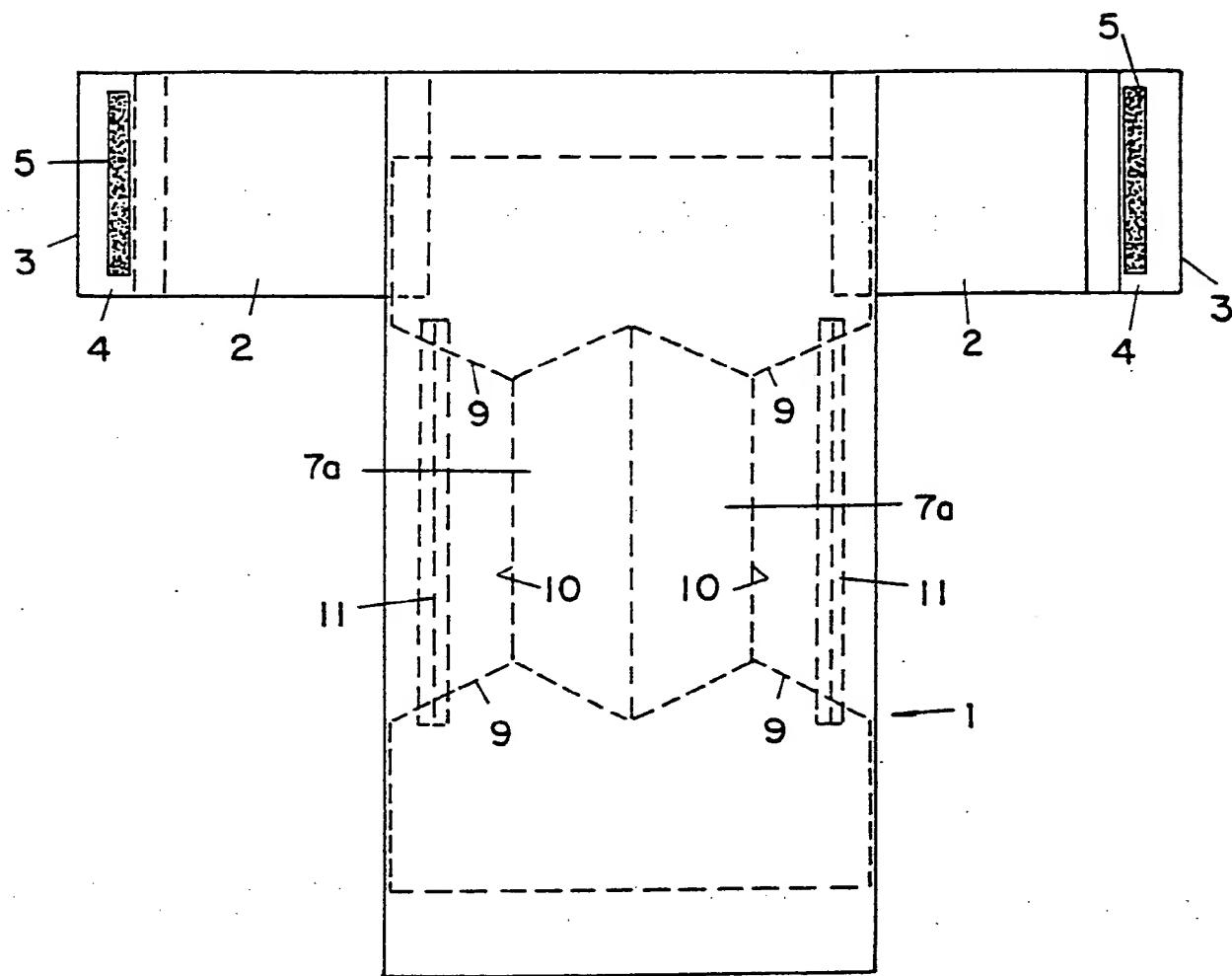


FIG. 4

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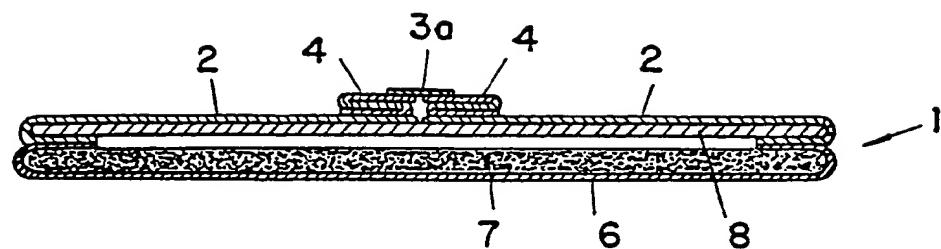


FIG. 5

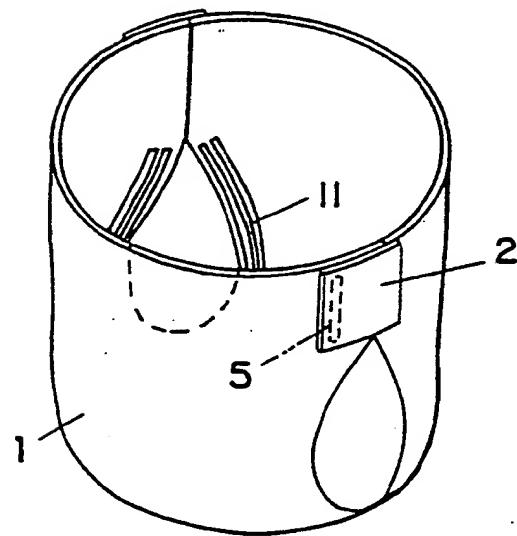


FIG. 6

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## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US84/00586

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) <sup>15</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl. A61F13/16

US Cl. 604/392

## II. FIELDS SEARCHED

Minimum Documentation Searched <sup>16</sup>

Classification System	Classification Symbols
US CL.	604/385, 392, 396, 389, 390

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>17</sup>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>18</sup>

Category <sup>19</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
X	US, A; 3,731,689, Published 8 May, 1973 by Schaar	1
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## IV. CERTIFICATION

Date of the Actual Completion of the International Search <sup>20</sup>

27 June 1984

Date of Mailing of this International Search Report <sup>20</sup>

06 JUL 1984

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